EXPERT PRO EVO TYPE 60500
OPERATING INSTRUCTIONS

General information

Congratulations on your purchase of the microcontroller charge station EXPERT PRO EVO from the CARSON range. To ensure trouble-free operation please read the instructions carefully before use.

1. FRONT PANEL

1. CHARGING CURRENT ADJUST SWITCH – adjusts the level of charging current
2. AC POWER SWITCH – Mains ON/OFF switch
3. BATTERY TYPE SELECT SWITCH – selects type of battery (Ni-Cd/Ni-MH or LEAD ACID) to be charged
4. MAINS POWER FUSE HOLDER – Fuse T3A
5. DC INPUT CLIPS – for 12/24V DC input
6. BUZZER – sounds at various stages during charge
7. LED INDICATORS OF POWER AND CHARGE
8. TEMPERATUR SENSOR – For sensing the battery temperature
9. AC INPUT PLUG – For mains supply
10. CHARGER OUTPUT TERMINALS
11. DISCHARGE/SELECT - discharge/battery number selector
12. FUNCTION STATE INDICATORS
    - BATTERY SELECT——indicator of selecting battery number
    - CHARGING CURRENT——indicator of charge current
    - BATTERY CAPACITY——indicator of battery capacity
    - BATTERY VOLTAGE——indicator of battery voltage
    - DISCHARGE CURRENT——indicator of discharge current
    - DISCHARGE VOLTAGE——indicator of discharge voltage
    - DISCHARGE CAPACITY——indicator of discharge capacity
13. DISPLAY BUTTON/CONFIRM - to view the display and confirm
14. LCD DISPLAY

2. Product description

The EXPERT PRO EVO is designed to charge NiCd /NiMH battery packs with 1 to 16 cells (1.2-19.2 V DC) or lead acid cells with 1, 3, 6 or 12 cells (2-6-12-24 V DC). Charge termination of NiCd/NiMH cells is by the delta Peak method and is temperature supervised. Charge control for lead acid batteries is by current and voltage regulation. NiCd/NiMH batteries can be discharged with a current of approx.1A. Charging current is adjustable from appr. 0.1A to 5A. The charger can be powered from 230 V 50Hz mains supply or 12 - 24V DC motor vehicle battery.

3. Technical index

Function	Description	Remarks
DC input voltage range	12-24V nominal	Normal
	Less than 9.5V or more than 27V	Warning, no function
AC input	230V AC +/-10%	Normal
Internal temperature and fan status	More than 50°C	Fan on
	Less than 40°C	Fan off
Battery temperature sense	More than 45°C	Charging switches to trickle charge state
Charging Current Adjustment	AC input	0.1...5A
	DC input	0.1...5A at 1...14 cells 0.1...4A at 15&16 cells NiCd/NiMH &24V SLA batteries to safe the vehicles fuse
Ni-Cd/NI-MH discharge	Discharge voltage is 0.9V...1.0V per cell	Discharge ready

4. OPERATION

Connect the charger to a 230 V 50Hz mains supply or to 12/24 V DC car battery. **230V operation:** Plug the mains plug into a suitable socket and switch the battery charger on at the power switch (position-). Make sure that the DC input crocodile clips are not short circuit. His can affect bad operation in damage of the charger. **12/24V operation:** Attach the battery charger directly to the car battery using the extension cable with crocodile clips supplied. Pay attention to correct polarity: + red, black -. In the 12 VDC mode the power switch is not used. The green power LED lights and the buzzer sounds for a second. The LCD display should read "AUTO", using the battery type select switch (3) select the correct battery type (NiCd/NiMH or Lead Acid). Turn the charging current adjust switch (1) to minimum. (fully anti-clockwise). Connect one of the two enclosed charge cables to the output jacks. Pay attention to correct polarity black to black for negative, red to red for positive). Attach the magnetic temperature sensor of the battery charger to the battery body. Connect the charge cable correctly to the battery (red =positive, black = negative). In the "AUTO" state, after selecting the battery type, you can press the "DISPLAY BUTTON/CONFIRM" for approx 2 seconds to start the charge process. The charger will identify the number of connected cells and start to charge.

The "NiCd / NiMH" charge indicator lights red. If you wish to select the number of cells manually press the "DISCHARGE/SELECT" (11) button a number of times to set the number of cells according to the battery pack that is connected. The number of cells will be shown in the LCD display. Then press and hold the " DISPLAY/CONFIRM" (13) button for 2 seconds to begin charging . During the charge process the bars in the battery symbol light from right to left to indicate the charging process. The operating mode on the LCD display can be selected using the "DISPLAY/CONFIRM" (13) button. By pressing this button once the mode of the LCD display changes from "BATTERY SELECT" to "CHARGING CURRENT". In this mode the charge current should be selected between 0.1A and 5A using the "CHARGING CURRENT ADJUST SWITCH". **Caution: Take note of the maximum permitted charging current from the battery**

manufacturer. If this value is not stated, we recommend a maximum of 1 C (e.g. a 3 Ah battery pack should be charged with a maximum of 3A charging current)". Press the "DISPLAY/CONFIRM" (13) button once more and the display switches to 'BATTERY CAPACITY" and the charged capacity can be seen in milliamps per hour (mAh). Press the 'DISPLAY/CONFIRM button again and the LCD display changes to the "BATTERY VOLTAGE" mode which displays the voltage of the connected battery pack in DC Volts. Once the charging process has been completed either by DELTA PEAK, maximum battery temperature recognition (>45°C), by Vmax or the safety timer (10h) the colour of the LED "NiCd / NiMH" changes from red to green, the buzzer gives a beep 3 times and the 4 bars in the battery symbol of the LCD display will be continuously on. The battery is now fully charged and provided with a trickle charge. Pressing the "DISPLAY/CONFIRM" (13) button with the battery connected will show BATTERY SELECTION, CHARGING CURRENT, BATTERY CAPACITY and BATTERY VOLTAGE. After disconnecting the battery from the charger or if the discharge mode is selected, the charged capacity value of the battery (BATTERY CAPACITY) will be reset to zero. During charge or trickle charge you can choose to discharge the battery by pressing the "DISCHARGE/SELECT" (11) button for 2 seconds to start to discharge, the NiCd/MiMH LED lights yellow and the discharge function begins. The LED flashes yellow at the end of discharge function and the battery capacity will be shown . In the discharge mode you can view the discharged battery capacity, the discharge current and the battery voltage. During discharging, or at the end of discharging, if the "DISCHARGE/SELECT" (11) button is pressed for 2 seconds the chargerwill automaticaliy begin to charge.

If charging Lead Batteries (LEAD ACID), set the battery type selector switch "NiCD /NiMH - LEAD ACID" to the LEAD ACID position. You can now set the charger in "AUTO" mode or adjust the nominal voltage of the battery to be charged with the "DISCHARGE/SELECT" button. Connect the charge cable correctly to the battery (red = positive, black = negative). Press the "DISPLAY/CONFIRM" button to start the charge process and the LED "LEAD ACID" lights red. The bar display in the battery symbol flashes from right to left. The operating state of the LCD display can be selected by pressing the "DISPLAY/CONFIRM" (13) button switch, as described previously.

Caution: Take note of charge currents recommended by the battery manufacturer. During charge of batteries near to full capacity, it is normal for the charging current to go down thus allowing the battery to be charged gradually.The charger will detect a full battery either when the end charge voltage for a 2V battery is 2.5V, a 6V battery is 7.5V, a 12V battery is 15V and a 24V battery is 30V or the temperature of battery probe is more than 45°C or when the current is less than 80mA or the safety time is more than 20 hours. The LED "LEAD ACID" will turn off, the 4 bars in the battery symbol of the LCD display are continuously on and the charger will begin to trickle charge the battery. After disconnection of the battery from the charger the charged capacity value of the battery (BATTERY CAPACITY) will be reset to zero

Beware: Always disconnect the battery from the charge cable first and then disconnect the cables from the charger– danger of short circuit! Always set the charger to the correct battery chemistry before connecting the battery!

5. Technical data

EXPERT PRO EVO	MODEL 60500
Input voltage	230V 50Hz OR 12...24 V DC
Input current	AC 1.2A / DC max. 15A
Output	1 – 16 Cells NiCd / NiMH 1.2 – 19.2V DC 1/3/6/12 Cells Lead Acid 2/6/12/24V DC
Battery capacity	Approx. 100 mAh – 20.000 mAh
Charge current	approx. 0.1 ....max. 5000 mA
Trickle charge	Pulsed
Discharge current	1...8 cells 2A / 9...16 cells 1A fixed
Discharge voltage	Approx 0.9V/Cell
Dimensions/weight	230x132x165 mm / 1.8Kg

6. Malfunction and Troubleshooting

If there is a failure during operation, the charger will stop charging or discharging, a warning code will be shown on the LCD, the buzzer will sound, see table below for possible reasons:

Warning code	Possible reason	Solution
EER1	Input voltage is more than 27V or less than 9.5V	choose the correct voltage range
EER2	Internal temperature is more than 100°C	Let the charger cool down
EER3	Battery short circuit or open circuit	Check the battery and connections to see if short circuit or open circuit
EER4	Wrong battery number	Reset the number
EER5	Reversed battery	Connect with correct polarity

7. Contents

1 x battery charger

1 x charge cable with Tamiya plug

1 x charge cable with crocodile clips

1 x operating instructions

8. Safety instructions

! Read operating instructions carefully before use.

! Do not expose the battery charger to rain, damp or hot conditions.

! When not in use, disconnect the battery from the charger and the charger from the mains.

! Do not charge hot batteries. Batteries must be at ambient temperature before charging.

! Only charge fast chargeable batteries! !

! Charging is only allowed after a previous discharge.

! Do not leave the charger unattended during operation.

! Immediately disconnect the battery from the charger if excessive heating occurs) **Explosion and chemical danger!** At a cell temperature of more than 45° the battery must be considered 100% charged. Charge only cool batteries.

! Charge only NiCd / NiMH or lead acid batteries. (No LiION batteries or primary cells **Explosion and chemical danger!**)

! Only connect the battery charger to suitable voltage sources. (230V 50 Hz OR 12/24V DC motor vehicle batteries). **Never both at the same time! Do not short circuit the DC input clips !**

! Do not open equipment or carry out repairs. Authorized personnel may only carry out repairs.

! Mains switch (2) is only in AC mode under function

! Do not cover equipment or obstruct ventilation, otherwise it may over-heat. Do not expose to direct sunlight.

! Do not charge more than one battery pack simultaneously.

! Charge only cells of the same type and capacity as a battery pack.

! Keep batteries, battery charger and cables away from combustible materials.

! Avoid sparking as there maybe gases present from the batteries.

! Never place the charger inside the engine compartment. Keep leads away from moving parts.

Technical details subject without prior notice. No liability assumed for typographical errors. 05/2004